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is not possible to fix with accuracy the date of the events it records, but the last king is probably identical with the man whom the Fulani ousted, which would carry back the history to 1040 A.D.

Later documents thus assign to the city greater antiquity than was conjectured by Barth, who, on the authority of Leo Africanus, expressed the opinion that early in the sixteenth century there was nothing of Kano excepting a fort on Dallah Hill.

GEOGRAPHICAL RECORD.

AMERICA.

THE CONTINENTAL PENEPLAIN OF NORTHEASTERN NORTH AMERICA.—The Laurentian Peneplain, proposed by Dr. A. W. G. Wilson (Journal of Geology, Vol. XI, No. 7, October–November, 1903), comprises the ancient crystalline area of northeastern North America, or nearly one-fourth of the continent, including all of eastern British America, Baffin Land, the Coast of Greenland, Newfoundland, the Adirondacks, and the crystalline belt of Lake Superior. This physiographic unit, the author states,

"extends through 58 degrees of longitude and 23 degrees of latitude, covering in all an area of over two million square miles." It is "not a single plain but rather made up of a series of facets intersecting at very low angles, three of which are distinguishable south of the main divide, so there are probably five facets and perhaps more."

This shield, the Canadian old land, has never been wholly submerged since the close of the Algonkian. In this long period denudation has reduced the area so nearly to base level that the surface presents the truncated stubs of intensely metamorphosed igneous and sedimentary rocks, evidently once deeply buried. Paleozoic sediments, revealed resting on the modified peneplain surface, indicate that the plantation, which was doubtless chiefly subaërial, took place before that period. The features of a plantation surface most evident are the even skyline and the low gradient of the surface. Between the Great Lakes and the Arctic elevations of over 50 feet are rare, and heights of 100 feet stand as landmarks; while levels on the peneplain, run along streams, lakes, and railways for distances of 300, 450, and 300 miles, show an average grade of 2.8, 1.8, and one foot to the mile respectively. This may be compared with the levels run along the railways on the Great Plains, which show a gradient varying from 2.1 to 3.8 feet to the mile. Departures from the normal peneplain type are exhibited in the absence of residual soil, which glaciation has swept from the surface, the departure of the drainage from the mature type, and innumerable lakes, also ascribed to glacial modification.

The elevations, such as the narrow belt of mountains which rises 4,000 to 6,000 feet in Labrador, scattered residual peaks of less than 800 feet elevation over the entire area, Trembling Mountain near Montreal, the Baraboo Ridge of Wisconsin, and the Adirondacks—all are monadnocks. The topographic depressions are (*a*) broad, shallow depressions between hummocky and undulating ridges, probably mainly of contemporary origin and due to differential erosion of the peneplain surface *plus* subsequent denudation; (*b*) depressions containing sedimentary deposits of Cambrian or Paleozoic age, perhaps faulted down as *graben;* and (*c*) gorge and cañon valleys, incised near the peneplain margin, the type of which is the ice-eroded fiord of the Saguenay. The region is now, the author concludes, in the youthful stage of a new geographic cycle.

One cannot but feel admiration for the analytical power and keen eye that thus trace back and portray the history of a continental area, a large portion of which has never been mapped, which has only been crossed in a few places, large reaches of which have never felt the tread of the foot of civilized man, and only a moiety of which the author has visited. L. M.

FORTHCOMING GEOLOGIC FOLIOS.—The Feb. 1st, 1904, index map of U. S. Geological Survey topographic sheets in the Middle Atlantic States indicates that almost all of New York State is mapped. Except a small area near Chautauqua Lake and the region about Ogdensburg along the St. Lawrence, in all about 20 quadrangles, all the primary control work and part of the field work is now completed, 21 sheets are now in course of publication, and 146 sheets have already been issued. At no distant date a map of any portion of the State will be accessible.

The series of geologic folios, on the eastern boundary of New York, which are not yet published, although the field work is completed, promises much to those interested in physiography. This series, which includes five four-sheet folios, partly in Connecticut, Massachusetts, and Vermont, and partly in New York, extends from near Waterbury, Ct., nearly up to Port Henry on Lake Champlain. Following the line of the irregular Lake Champlain and of the deep Berkshire Valley, and cutting diagonally across the N. W.-S. E. axis of ice movement, this series of folios will together constitute an attractive physiographic study. It will be interesting to see what disposition the authors of the various folios make of several mooted questions.

There are five other folios in the State, all scattered and each presenting a different type of region. One, the New York City Special, is already published. On the others the field work is completed.

There is a four-sheet folio, northwest of the series just mentioned, in the region of the highest Adirondacks. There is a four-sheet folio just east of Niagara Falls, including parts of the two plains, separated by the Niagara escarpment. There is a two-sheet folio, including the Olean and Salamanca sheets and lying just north of Pennsylvania. Finally, there is the four-sheet Watkins Glen folio, which includes the lower ends of the two largest Finger Lakes and the upper headwaters of the Susquehanna. This folio is especially important, because it lies in the region of Cayuga and Seneca Lakes, a country rich in gorges and waterfalls, and near an important educational centre, Cornell University. This and the folios north and east of it, when prepared, should, therefore, be of the highest value to students of physiography in that institution. The mature upland, deeply dissected, with the deep, winding Finger Lakes, and the higher hills near the Pennsylvania boundary, presents drainage problems that are perplexing, the solving of which will be of the utmost value. L. M.

CHANGES OF LEVEL AT CAPE ANN, MASSACHUSETTS.—A drowned seacoast, like that of New England, is not difficult to recognize, but evidences of greater depression than now exists are not common enough to be passed by without remark, nor are the criteria for the identification of such former levels as yet established. Professor Tarr (Bull. Mus. Comp. Zoöl., Vol. XLII, September, 1903) presents evidence of a preglacial stand at Cape Ann at a lower level than the present, and establishes his point by the aid of indisputable collateral evidence. The Cape is a granite boss, partly covered by morainic deposits; but at levels below 40–60 feet the glacial deposits have been stripped away, leaving bare granite rock with perched boulders and extensive areas of stratified deposits. This stripped area, as previously shown by Shaler, is interpreted as sea-washed. Additional evidence of former post-glacial depression of this region is found in the presence of an area of sand dunes no longer in movement, and in a position where good supply is not possible at the present stand of the land. The dunes have long been unmoved, the sands are discoloured by iron oxide, and a forest grows on them. Besides an elevated sea cave and deposits of stratified drift of no definite form, but confined to the horizon between the 40 and 60 foot contours, there are delta deposits, and numerous beaches and gravel bars of indisputable character at about 60 feet above sea-level; but nowhere are marine fossils found in them.

A portion of the paper is devoted to a description of a fossiliferous series of clays and sands underlying glacial till and interpreted as probably interglacial. These beds had previously been discovered by Professor Shaler, but recent cuts have clearly shown their characteristics and relation to the overlying till. The till rests on them unconformably, and the strata are folded and faulted, evidently as a result of the ice thrust. The clays contain large boulders, indicating drift ice, which could scarcely have brought them in water having a depth of less than 100 feet. That these clays were formed in cold ocean water is proved by the fossils, such as *Yoldia siliqua*, *Aphrodite groenlandica*, and others, now no longer living in the waters of this region, but abundant in the waters of the Arctic. The fossil-bearing bed is from 15 to 20 feet above mean sea-level, and the marine deposit beds extend fully 10 feet higher, indicating subsidence during their formation fully 30 feet below the present level.

In a note appended to this paper J. B. Woodworth describes beaches and other evidences of wave-action on a part of this same promontory at levels between 60 and 80 feet. His observations are in accord with those presented by Professor Tarr. L. M.

THE ANDOVER DELTA-PLAIN.—The "Indian Ridges" of eastern Massachusetts are so nearly classical ground to the glacial geologist that any contribution relating to them, even though an exceedingly specialized local study, is of interest. A recent paper by Professor F. S. Mills of St. Lawrence University (American Geologist, Vol. XXXII, September, 1903), on the Andover Delta-Plain, describes an interesting deposit in this region, and contains a plea, based on rational premises, for the name delta-plain in place of sandplain. Mills bases this plea for the adoption of Professor Davis's name on the ground that sandplain is incongruous, delta-plain both descriptive and generically true.

The delta-plain described is situated near Ballardvale, 23 miles north of Boston. It is a typical level-topped, cuspate mass of gravel and sand, a mile by a mile and a half in area. Sections reveal back-set beds where the stream, emerging from the ice-front, had to ascend over its own accumulations. Lenses of unstratified material, probably dropped by icebergs, and a gradation of material from ice-contact to front, were noted. The plain was probably built quickly, the glacial lakelet overflowing southward for a while; but withdrawal of the ice reversed the drainage into the Merrimac. An esker feeds the delta-plain, changing northward into a broad, indefinite kame area (Stone's " plexus"), then, resuming the definite ridge form of an esker, crosses the Shawsheen River, and joins the " Indian Ridges," from which a great esker extends northward into New Hampshire. Mills publishes excellent half-tones of the delta-plain and of sections in it. L. M.

MOUNT MONADNOCK.—The use of the term *monadnock*, introduced by Professor Davis as the name for a peak rising well above the general level of a surrounding peneplain, has attracted to Mt. Monadnock, in southern New Hampshire, an interest far greater than would normally belong to a small peak in a remote region. In a recent number of the Journal of Geology (XII, 1904, 1–14) Perry describes the geology of this peak in some detail. He finds it to be a syncline of andalusite-fibrolite schist, probably of Carboniferous age, with granite around the base. To the physiographer the most interesting part of Perry's paper is his brief consideration of the reason for the decided elevation of Monadnock above the surrounding lowlands. He states that there is nothing about these rocks to indicate that they are more resistant than the surrounding granites and schists. This leaves as the only explanation of the elevation of Monadnock its location on the eastern preglacial divide of the Connecticut Valley. To those who question the application of the peneplain theory to the uplands of New England this conclusion of Perry's is of decided interest. It is exactly what one would expect to be the case on the theory of bevelling, by which, instead of a general peneplain, the region is believed to have been reduced to a hilly and low mountain region of decided irregularity, retaining greatest elevation along the divides. How such a region of decided elevation as that of Monadnock could have stood up through the enormously long period of time required for general peneplanation, unless it is a region of much more resistant rock, is exceedingly difficult to understand. R. S. T.

THE PHYSIOGRAPHY OF THE TENNESSEE RIVER VALLEY.—In the southern Appalachians there is a peculiar condition of drainage where the Tennessee, just below Chattanooga, leaves the broadlyopen Appalachian valley, turning abruptly westward and crossing the plateau in a deep, narrow gorge. Why the river should not continue on in the broad valley, where the divide between the Coosa and the Tennessee is very low, has been a question of interest to physiographers. Several years ago Hayes and Campbell proposed as an answer to this question the theory that, up to late Tertiary time, a river, the Appalachian River, actually did occupy this valley, entering the Gulf along the line of the present Coosa valley. Stream capture from the west has led the upper part of the Appalachian River (the present Tennessee) westward across the plateau.

In a recent paper (Journal of Geology, XII, 1904, 34–39), Mr. Charles H. White questions this theory on several grounds, and proposes in its place the theory of an original west-flowing drainage from the Great Smoky Mountains across the Appalachian valley and the plateau. The region was lowered to the condition of a peneplain and the streams developed a meandering course, one of the meanders being preserved in the swinging course of the Walden gorge. With uplift of the peneplain the Tennessee sunk its gorge in the plateau, and broadened its valley in the weaker strata of the Appalachian valley, increasing its extent by headwater capture until all the transverse streams had been led off through the Tennessee gorge. Further development of headwater capture, greater in south-flowing than in north-flowing streams because of greater uplift in the northern part, threatens capture of the Tennessee, leading it southward along the Appalachian valley directly to the Gulf. According to White's explanation, therefore, the Tennessee, instead of having captured a part of an Appalachian river, is in danger of being captured itself by an Appalachian river still in process of development. R. S. T.

THE UPPER KERN BASIN, CALIFORNIA.—An excursion of the Sierra Club to the Upper Kern Basin, California, in the summer of 1903, gave to Professor A. C. Lawson opportunity for some interesting studies in the high sierras, which he has recently published (Bull. Dept. Geol. Univ. of California, Vol. 3, 1904, pp. 291–376) under the title of "The Geomorphogeny of the Upper Kern Basin." The region is one of massive granite, crossed by an exceedingly well-developed series of joint planes, which have had a profound influence on the topography. The uplands attain a moderate degree of uniformity of level, such as would lead most physiographers at once to pronounce the region a dissected peneplain; and we have come to expect so confidently such an interpretation of this phenomenon that it is a surprise and encouragement to find a physiographer of Lawson's rank proposing another explanation. His hypothesis is that the great granite intrusion was arched over by sedimentary strata, nearly all of which have been removed, and that the present upland surface had its level determined by this discordance between weak sedimentary strata and resistant granite.

Kern River occupies a cañon in this granite mass which Lawson assigns to rifting or the opening of fissures in the granite parallel to the course of the cañon. Only a small part of the cañon is to be accounted for by block-faulting, or the "engulfment of *graben* wedges or slabs," but most of it by stream erosion directed by the rifts. R. S. T.

GLACIATION OF THE KERN BASIN, CALIFORNIA.—In his study of the physiography of the Kern Basin, Lawson discusses also the subject of former glaciation and its effects, a valley glacier developed in the basin attaining a maximum length of twenty-four miles from the head of the cañon and receiving numerous tributaries. The glacier had little effect in widening or deepening the cañon, but Lawson believes that glaciation had a profound influence on the formation of cirques and on the sharpening of mountain divides and the lowering of mountain crests, in this following Johnson (Science, N. S., Vol. 9, pp. 112–3) and Matthes (21st Ann'l Rept. U. S. Geol. Surv., 1899–00, Part II, p. 167). The cirques usually occur on both sides of a mountain crest, and their enlargement at first forms a narrow ridge, and finally a low, level col or pass. Lawson goes to an extreme in the application of the principle of cirque enlargement when he indulges in the speculation that it would not only remove the mountain tops, but that "Glaciation in the high mountains, in so far as it depends on altitude, is, therefore, a process which automatically terminates" by so lowering the mountain as to make further glaciation impossible. The entire subject of cirque formation is one well worthy of extended comparative study to determine how much of it is due to glacial work and how much to the normal processes of frost action, sapping, and other forms of subaërial denudation at valley heads in lofty mountains, especially in regions of crystalline rock. R. S. T.

PHYSIOGRAPHY OF WASHINGTON.—In a recent professional paper (No. 19, 1903) of the U. S. Geological Survey there are two contributions on the physiography of the State of Washington, one by G. O. Smith on Central Washington, the other by B. Willis on the Wenatchee-Chelan district of the Cascade Range. In each paper there is a description of the general physiography of the region and an interpretation of the principal physiographic phenomena.

According to Smith's interpretation the Central Washington region is an extensive peneplain, deformed, even to the extent of forming anticlinal mountain ridges and synclinal valleys. The deformation has resulted from at least two distinct periods of crustal movement, and the region has been extensively dissected by denudation, especially in the Cascade Ranges. Following Russell, Smith interprets the Yakima River as an antecedent river of exceptionally fine type, which has maintained its course across several uplifted ridges. The original meanders of the river are preserved in the deep cañon which the Yakima occupies in its course across these ridges. The uplift of the ridges was not sufficiently rapid so to dam the Yakima as to force it to seek a new channel.

Willis also recognizes the peneplanation, but with more complex history. The readiness with which this physiographer picks out from the maze of mountains the several stages of physiographic history cannot but challenge admiration for the keenness of his observation and the power of his constructive imagination. Yet it could be desired that he had given to alternate hypotheses as thorough consideration as he has to peneplanation, or, if he has, that he should have published his analysis. But this is an age of peneplains, and it is well known that the pendulum of scientific adherence to hypotheses often swings far to one side. The reviewer is wondering when the pendulum of peneplain interpretation will commence to swing back toward a more normal position.

Among other phenomena considered in Willis' paper is the remarkable valley of Lake Chelan, which he describes and interprets. He agrees with Gannett in interpreting the unusual character and depth of the Chelan Valley as the result chiefly of glacial erosion. The valley had a large volume of ice tributary to it from mountains 350 square miles in area, attaining altitudes of 7,000 to 8,500 feet. The ice was forced through a mountain cañon of remarkable depth and narrowness, and is believed to have eroded the valley to its present depth, which, through a distance of 16 miles, exceeds 1,000 feet, and in one place is 1,419 feet, or 340 feet below sea-level.

R. S. T.

BRAZILIAN TOPOGRAPHIC MAPS.—The Brazilian State of São Paulo, of which an American, Professor O. A. Derby, is Chief Geographer and Geologist, has issued a number of topographic contour maps of its area, most of the State having been already mapped. The sheets are on the scale of 1:100,000, with a contour interval of 25 metres, and are not less good than we should expect from a survey of which Professor Derby is the director. They differ in no important essential from the topographic sheets of the U. S. Geological Survey.

The São Paulo sheet, containing the seaport Santos, and the capital, São Paulo, with the railway, which ascends 3,000 feet in nine miles, presents interesting physiographic phenomena. A drowned coast, with lofty mountains, is backed by a plain whose drainage is so sluggish that swamp conditions obtain in all the stream valleys. The short east-flowing streams, descending precipitously to the sea, with high grade and abundant cutting tools, have carved deep gorges; and their headwaters promise, at no distant date, to carry off to the high seas the pirated waters of members of the leisurely-inclined drainage system of the level plain above. The country looks intensely interesting to the physiographer, and we shall look forward with expectations of valuable contributions to the further publications of a survey whose detailed mapping is to be based on so excellent a foundation. L. M.

EUROPE.

THE SIMPLON TUNNEL.—This great engineering work is rapidly approaching completion. The tunnel will be a little over 12¼ miles in length, of which about 11 miles are now completed. The boring of the Simplon was decided upon by Italy and Switzerland, the two countries voting $15,054,000 to carry out the work, which began in November, 1898, and was to be finished within five years. Great difficulties have recently been experienced, on account of the immense amount of water entering the tunnel. A new plant of pumping machinery had to be installed, and, as a result, the contractors have asked for an indemnity from the two Governments. The opening of the tunnel will directly connect the English Channel and the Adriatic Sea, and it will be the only route to compete with the St. Gothard tunnel. It will give the shortest line between England, Milan, and Brindisi, and, naturally, the Indian mail will travel by this route.

TRAVELLING IN DISGUISE IN TURKEY.—Gottfried Stransky, of Austria, spent about two months, in the summer of 1903, travelling through eastern Albania and a part of Macedonia. The region visited is not very well known, and the journey might have been fruitful in geographical results if the political conditions had been better. It was necessary to travel in disguise, and so Mr. Stransky assumed the name of Jussuf Effendi, wore a white fez, carried a pack on his back, and gave himself out as a Turk from Constantinople. His acquaintance with the Turkish, Bulgarian, and Greek languages and his assumption of the *rôle* of a very poor man collecting insects, to sell them to a museum, enabled him to make a journey that was rich in experiences, though poor in scientific aspects. The description of his journey appears in the *Mitteilungen* of the Geographical Society in Vienna, Vol. XLVI, Nos. 11 and 12.

ASIA.

Economic Development in Sechuan.—Lieut.-Col. C. C. Manifold, who has recently travelled extensively in Central and Western China, has an interesting paper in *The Geographical Journal* (March, 1904), largely devoted to the rich province of Sechuan. Though one trading steamer, the *Pioneer*, has successfully ascended the rapids from Ichang, the head of navigation for large vessels on the Yangtse, to Chung-king, the capital of Sechuan, it remains to be proved that steam navigation through these gorges can be made a profitable commercial enterprise. The western part of Sechuan is a wild, inhospitable region of high mountain ranges, with limited agricultural resources, and rivers too impetuous for junk navigation. It possesses great wealth in unworked deposits of the precious metals. The eastern part of the province has an area of nearly 70,000 square miles, a population approaching 50,000,000, and, though originally a plateau of soft red sandstone, it has now been worn down into a rich, fertile country of innumerable small valleys, bordered by hills, whose sides are terraced with fields to their summits. The whole country is under the closest cultivation, and parts of it support the densest population, to the square mile, that is to be found in any agricultural area in the world.* In many places two crops are grown in the year, and the soil is kept in a condition of high productiveness by fertilizers, whose value is fully appreciated.

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* Lieut.-Col. Manifold's figure for population does not agree with that given by the *Statesman's Year-Book*, 68,724,890 for the 218,480 sq. miles of Sechuan, and it greatly exceeds the cautious estimate of 45,210,000 in the *Almanach de Gotha*. The statement as to the density of population in parts of Sechuan can hardly be accepted, in the absence of data to dispute the supremacy of Barbados, with 1,178 inhabitants to the square mile.

Editor Bulletin.

The country has a great future, for it is uncommonly favoured with coal and iron deposits, in addition to gold, copper, petroleum, and salt. Silk, wool, and hemp are manufactured to a large extent, and the textile industries are capable of a great development. The manufacture of paper and the production of oil, sugar, etc., are large, and rapidly increasing. Another blessing of the province is an abundance of cheap and skilled labour.

In his journey across China from the sea to Yünnan, the explorer remarked the decay of Buddhist temples and monasteries nearly all over the land. He says that, except in Mongolia and the extreme west of China, the observance of Buddhist rites is rapidly declining.

AFRICA.

SURVEYS IN NORTHERN NIGERIA.—The London *Times* says that a party left England on Feb. 28, under the leadership of Lieut. Boyd Alexander, for West Africa, to conduct a survey of the eastern portions of the Northern Nigeria Protectorate. The expedition will ascend the Niger to Lokoja, travel up the Benue, and finally across the country northeast to Lake Chad. Specially-constructed steel boats for the navigation of shallow rivers were taken. The party will probably not return to England for two years.

In his address before the Royal Geographical Society on Nov. 4 last, Sir F. D. Lugard, High Commissioner of the Protectorate, spoke of the need of continuing the surveys and of ascertaining the exact positions of important towns throughout the country. He added that the exploration of the Kaduna and Gongola tributaries of the Benue is likely to have an important practical bearing on the development of the country. Mr. Moran has proved that the Gongola is navigable for a short time when in flood, as far as Gombe, and may be utilized to push telegraph and building material and other stores northward without incurring the great expense of land portage.

ADMINISTRATIVE DIVISIONS OF THE FRENCH CONGO.—The French Congo is too large to be governed from one or two administrative centres, and for this reason the Government has divided it into four distinct districts. The colony of Gabon, comprised between Spanish Guinea, the Cameroons, and the Congo basin, will constitute a colony directed by a Lieutenant Governor residing at Libreville. The Middle Congo, extending south and east of

Gabon and limited on the east by the Congo and the Mobangi Rivers, will be a colony under the authority of a Commissioner. The Mobangi-Shari, comprising the region to the north and east of the River Congo and limited to the north by the seventh parallel and the Egyptian Sudan, will be a territory administered by a delegate of the Commissioner General residing at Bangui. The Territory of the Chad will comprise all the region to the north of the Mobangi-Shari, as far as the Sahara desert, which is under the influence of France. It will be governed by the officer commanding the troops stationed in this territory.

OCEANIA.

Exploring the Largest Island of the New Hebrides.—In August, 1901, a party of Frenchmen explored Espiritu Santo, the largest and most northern island of the New Hebrides group. This island was discovered three centuries ago by the Portuguese sailor Queiros, who gave it the name it bears. He believed it to be a part of the reputed great southern continent. He landed on its northern shores in the deep Bay of St. Philippe and St. Jacques, but since that day, May 1, 1606, the island had remained almost unknown. It embraces about one-fourth of the area of the entire archipelago. The facts about the recent exploration, with a map of the island, were communicated to the Lisbon Geographical Society (*Boletim*, Nov., 1903) by its corresponding member, George Collingridge of Australia.

The party numbered about thirty men, chiefly French colonists of Vaté, and other islands of the group and a number of Kanakas. They started inland from Segond Channel, on the south coast, to cross the high plateaux of the interior to St. Philippe Bay, on the north coast. Mr. Largeau led the party, and Mr. Ollivier was naturalist and botanist.

The party forced their way north with difficulty through the thick undergrowth, tracing the meanders of the swift River Sarakata, the largest stream of the island. The natives fled before them to the interior. On the third day they approached the mountain retreat of Chief Leo, noted for his cruelty, and sent a messenger to inquire how he intended to receive them. As he sent no answer, they ascended his mountain with some solicitude, but found him very ill. The doctor of the party relieved his distress, and the white men were well treated Pushing northward to a high plateau in the heart of the island, they enjoyed the fine climate at this elevation (figures not given) and the splendid panorama of the Sarakata valley.

Chief Sanapo, in this region, wished them to join him in war on a neighbouring tribe which had stolen one of his women. He could not be made to understand why the French would not take part in his quarrel, and he left them in a sullen mood.

They found that the west of the island is traversed by a mountain chain extending north and south, its culminating summit, at its southern termination, being 5,520 feet high. Another chain from the northwest of the island crosses it diagonally to the southern end of the western mountains, and forms the water-parting between the Sarakata, the Belchif, and other south-flowing rivers and the Jordan and other small rivers flowing north and emptying into the Bay of St. Philippe and St. Jacques.

POLAR.

ICE CONDITIONS IN THE ARCTIC SEAS IN 1903.—The Danish Meteorological Institute has just issued its annual *Report* on the state of the ice in the Arctic seas. It covers the year 1903, and presents five maps showing the ice conditions as far as they could be ascertained for each month, from April to August, inclusive. The conditions in Barents Sea were generally unfavourable throughout the summer, except in the waters around Bear Island, which were ice free from the beginning of April. Off South West Land and in Storfiord, Spitzbergen, the state of the ice was unfavourable, owing to the large quantity from east Spitzbergen. North Land was inaccessible until late in July.

On the coast of East Greenland the breadth of the ice-belt north of Jan Mayen was normal until August, when it greatly diminished. At Angmagsalik, further south, the ice conditions were unusually favourable through June, July, and August, and the sea was quite ice free in August. Around Iceland the state of the ice was about normal.

Icebergs in the spring and summer were more abundant than for many years. The Labrador current brought into the temperate seas an unusually large number of them. The sea ice drifting south from the polar ocean into the North Atlantic was about normal in quantity. Melville Bay, on the west coast of Greenland, was filled with pack-ice until the middle of August, and two whaling steamers were prevented from reaching the fishing ground in the western part of Baffin Bay. Cape York was attained by the whalers on June 26.

The condition of the ice in Bering Sea was unfavourable throughout May, but both the eastern and western passages were navigable early in June, and Bering Strait about June 20. During August and September pack-ice lay from one to ten miles from the shore, between Point Barrow and the mouth of the Mackenzie River. The Institute repeats its appeal to all voyagers in the Arctic regions to forward all obtainable details for 1904 to its office in Copenhagen.

A RUSSIAN ARCTIC EXPEDITION.—*Nature* says that the St. Petersburg Physico-Chemical Society intends to send out an Arctic expedition for the observation of solar radiation and atmospheric refraction of cloud movements and of atmospheric electricity, in connection with the extinction of the ultra-violet light; also, for the determination of the phenomena of terrestrial magnetism and of electric currents in the ocean, for chemical analyses of the composition of the air and water, and for the examination of the polar ice.

SCIENTIFIC STATION ON THE ANTARCTIC.—By an arrangement between Mr. Bruce, leader of the Scottish National Antarctic Expedition, and the Argentine Government, the magnetic and meteorological station established by Mr. Bruce at Scotia Bay, in the South Orkneys, is to be continued by the latter. The buildings have been handed over to the Argentine Government, with provisions for eighteen months, and when Mr. Bruce returned south he took with him three Argentine scientists to man the station. The Argentine Government has offered the position of chief of the station to Mr. Robert C. Mossman. The results of the observations will be published by the Argentine Meteorological Office (*Scot. Geog. Mag.*, March, 1904).

NEW MAPS.

AMERICA.

SOUTHERN PATAGONIA AND TIERRA DEL FUEGO.—The Land of Magallanes. Illustrating a paper by W. S. Barclay on the Fuegian tribes. Natural scale, 1:2,000,000, or 31.56 statute miles to an inch. *The Geographical Journal*, Jan., 1904. Shows by colors the habitat of the Ona Indians on the plains of eastern Tierra del Fuego, of the Alacaluf Indians along the western coasts of that island (Cape Horn and Beagle Channel), and of the Yahgan Indians along both shores of the western half of Magellan Strait. According to Mr. Barclay, these tribes are smaller than has usually been supposed. The Onas number about 600, and live entirely on land; the Alacalufs, nearly 800, live partly in canoes, partly on land; and the Yahgans, under 200, entirely canoe-dwellers.

UNITED STATES.—Economic Map of the Yukon River, Alaska. Scale, about fifty statute miles to an inch. By Arthur J. Collier. (Bulletin 218, U. S. Geological Survey.) Washington, D. C., 1903.